NEWSLETTER February 2006

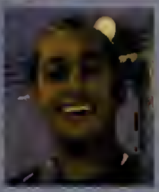
BLUE SKY SOLAR RACING
University of Toronto

Welcome to the 2007 racing season!

On behalf of Blue Sky Solar Racing I would like to welcome you to the 2007 racing season. After a long year, the team is all geared up to complete our 2005 solar car. We all eagerly await the upcoming years activities. I would like to begin by introducing you to our 2007 core group which will lead the team through the development, design, fabrication, and showcasing of our car.

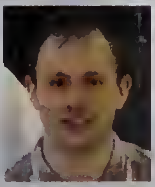
Andreas Marouchos
Managing Director

Raymond Oung
Battery and Mechanical Systems Lead


Mitren Sukhram
Aerobody and Fabrication Co-Lead

Spondon Hazarika
Array Systems Lead

Dmitri Stepanov
Aerobody and Fabrication Co-Lead


Tom Rodinger
Electrical Systems Lead

Patrick Pritchard
Media Systems Lead

Returning from last year are Raymond, Tom, Mitren, and Patrick who have decided to stay on and to help lead the new team. New to the core group are Spondon and Dmitri who have shown unparalleled enthusiasm and work ethic. Together we look forward to a year filled with great events.

Over the past year the team has struggled to complete the car after the unfortunate vehicle collision in late 2004 that took the life of our team-mate and friend Andrew Frow. On behalf of the team I would like to thank all those that provided support to the team during this difficult time. The outpouring of support has helped inspire the team and will drive us to succeed in the upcoming 2007 season.

The new race season has begun on a very positive note as our on campus recruitment effort attracted over 100 enthusiastic students. This year we have a wide variety of new members from all corners of the UofT campus including physics, politics, zoology, and engineering. In addition, the team continues to have active members from architecture and the Rotman School of Management. Together our new team has already begun to foster new ideas and bridge new gaps between the various disciplines here at the university.

With our new team in place we look forward to completing the 2005 car in time for the 2006 summer sun! As always our team leaders will be updating their progress on our website so please check regularly for updates and photos.

Until then, we will continue to attend a wide variety of public and corporate events to promote sustainability and innovative engineering design.

Andreas Marouchos
Managing Director

Any given day at the shop: team members working on the new car.

Andrew's Memorial Fund

The outpouring of support to Andrew's memorial fund has remained strong over the past year, a testament to his impact on the team, and teams impact on our family of supporters.

To date there have been over 150 donors who have collectively raised over $150,000 for the fund. The team would like to thank all those who have supported the fund.

Recent Activities

In September 2005 the team participated in the annual UofT wide FROSH week events. The Engineering Clubs Day and the Student Academic Council Clubs Fair events gave a chance for both new, as well as upper year students to see what the team is all about. Our recruitment efforts attracted over 100 students.

The team also participated in UofT's Fall Campus Day in an effort to excite and attract prospective UofT students and parents alike. A sunny day assured plenty of power from our array, which we used to liven up the mood by powering a stereo.

Photo: Patrick Pritchard

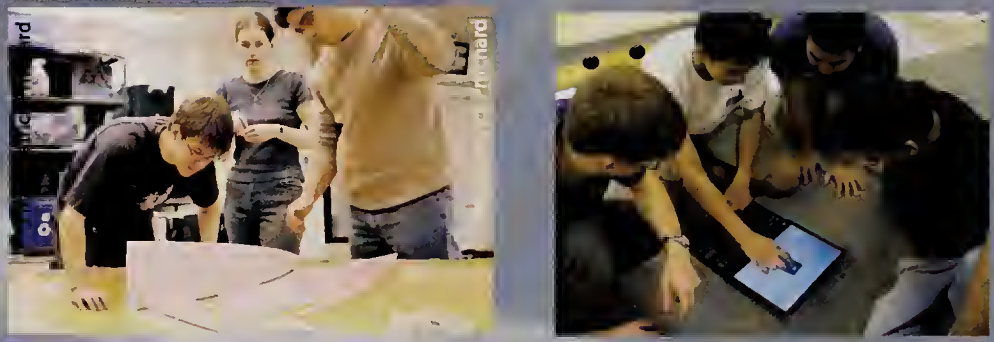
Group Photo at UofT Campus Day with 2001 Aerobody

On November 17th the Blue Sky Team was honoured to welcome **Steven Strong** to a guest lecture sponsored by the Department of Electrical and Computer Engineering entitled **Sunlight is Life**. Mr Strong, a renowned engineer turned sustainability architect has always been a great supporter of solar power systems. His talk attracted students, professors, industry consultants, and investors, and led to a lively discussion and question session afterwards. The team was proud to present our car at this event to provide some hands on context to the lecture topic.

On the technical front, for the eight months from January through August 2005, the team was hard at work completing the moulds at **Bombardier**'s Downsview facilities. The moulds were made using the plugs constructed in the summer of 2004 at **Reko**. Once the moulds were finished and cooked in an oven, they were ready to be used to manufacture the parts which will become the new car's aero shell.

A roll of Kevlar provided by **JD Lincoln** and honeycomb Nomex board provided by **Composites Altantic** allowed us to complete the layup of our upper shell in early fall. Due to a worldwide composite shortage the team is now waiting to acquire the remainder of the composite material required to build the bottom aero shell and chassis. Tentatively the 2005 car will be ready for track qualification this summer.

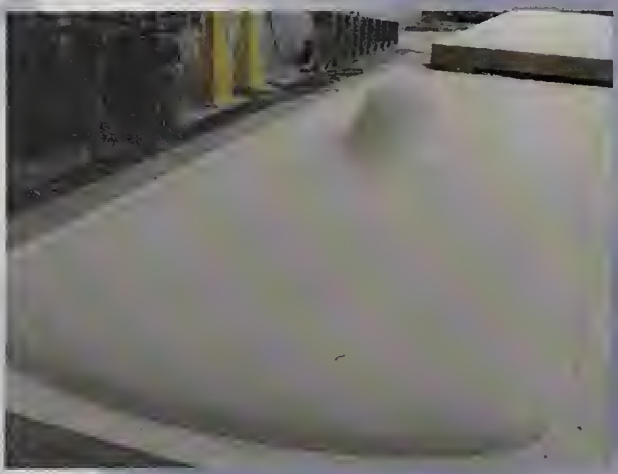
The electrical group has also been hard at work completing the electrical systems of the new car. The electrical system has been in the works for the past three years and will bring to the car a completely new architecture built for reliability, weight saving, and power efficiency. One of the showcase developments is the custom design of peak power trackers (PPT's), which are used to maximize the amount of energy collected from the sun.



Inspecting foam tempates for upper aerobody structure ribbing and finalizing mechanical design

The design of the mechanical system is well under way. Members of the team are working together with a panel of three experts to refine the design in a way to maximise safety while keepin the weight to a reasonable level. Machining of parts will begin this spring.

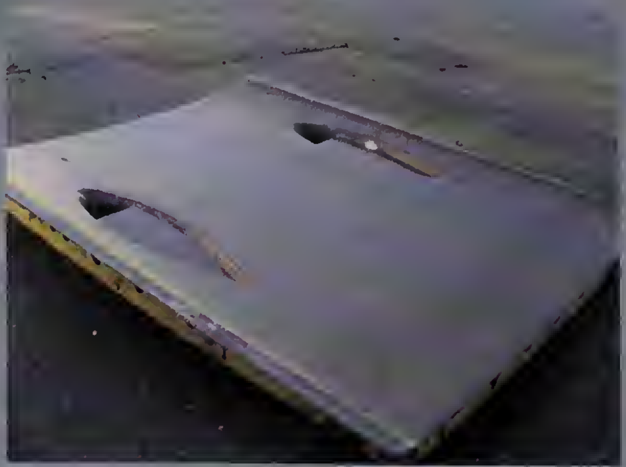
Upper aerobody layup process: laying up Nomex and Kevlar weave



Completed plugs of the 2007 car

Photo: Patrick Pritchard

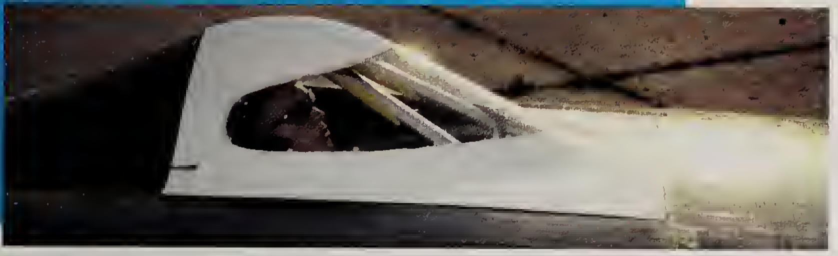
Spondon setting up Faust 2001 array



Completed mould for the 2007 car

AWAKEN THE IMAGINATION

Take part in the exciting world of solar racing by showing your support for the University of Toronto team. U of T Blue Sky Solar Racing will be representing Toronto and Canada on the international stage at the biennial American Solar Challenge and World Solar Challenge (Australia) during the 2005 solar racing season.



SOLAR RACING: A Competition in Sustainability

Solar cars must complete the 3000+ kilometres of each race powered only by the energy of the sun. The sun's rays are collected using triple junction gallium-arsenide solar cell technology. Unlike cheaper commercially available silicon solar cells in the 12-17% efficiency range, gallium-arsenide cells can reach efficiencies beyond 30% (the sun casts~1000 watts / m2 to the Earth's surface). A triple junction cell has three layers of energy-converting wafers compared to conventional single wafer solar cell technology. The primary application of such high-tech solar cells is on communication satellites and Mars rovers.

U of T's 2005 two-seat racecar will use 4000 gallium-arsenide solar cells at an average efficiency of 27%. Under blue-sky conditions, the car's solar array can convert enough energy to cruise at 90 kilometres per hour (vs. 70 kilometres per hour using silicon cells) without drawing energy from the car's lithium-ion battery pack. However, hills, wind speed and direction, atmospheric temperature, solar intensity and cloud condition all impact the car's performance. Each race day requires precise measurements and calculations in order to determine how fast the natural environment will allow the car to travel without running out of energy before the finish line.

BACK THE FUTURE, name your cell

By adopting a solar cell, you will be making a commitment not only to the advancement of a power source of the future, but also to the development of the great minds that will lead the way. Undergraduate and graduate students from U of T's Faculties of Applied Science & Engineering, Arts & Science, and the Joseph L. Rotman School of Management gain valuable experience working with renewable energy technology and researching its social and economic impact on our daily lives.

The dedicated student volunteers that make up U of T Blue Sky Solar Racing are committed to educating the community about renewable energy. Blue Sky publishes reports on environmental technology, engages the public and regularly visits primary and secondary schools throughout Ontario.

As an Adopt-a-Cell donor, your name will appear on the back of each solar cell you contribute towards. In addition:

- Your name will be listed on our website, www.blueskysolar.utoronto.ca, indicating where your solar cells are located on the car
- You will receive an official certificate of recognition from the University of Toronto team, a poster of the 2005 U of T Solar Car, and quarterly newsletters

As a charitable donation to a U of T program, you may be able to double the impact of your gift through the Corporate Matching Gifts. Talk to your employer's HR department or board to find out if they participate in the corporate matching gift program, or check the full list of participating companies at: http://www.giving.utoronto.ca/annual/cmg_list.html

A better future starts with you.

Complete the Adopt-a-cell form below and along with your payment, return to:

U of T Blue Sky Solar Racing / 35 St.George Street, Room 173, Toronto Ontario M5S 1A4

Name:

Address: **City:** **Province:**

Postal Code: **Telephone:** **Email:**

- ☐ My donation qualifies for Corporate Matching Gifts [please attach the necessary documents]
- ☐ I am a member of the faculty or staff at U of T [donations will be matched by the university]
- ☐ I wish to remain an anonymous donor

Payment Method - DO NOT SEND CASH - [mark one]:

☐ Cheque / Money Order [payable to U of T Blue Sky Solar Racing] ☐ Visa ☐ Mastercard ☐ American Express

I hereby authorize the payment of $ ________________ [# of cells x $30] to the U of T Blue Sky Solar Racing.
[Charitable Registration # 1081-62330-RR-0001]

Credit Card No: ________________ Expiry Date: ________________

Name on Card: ________________ Signature: ________________

Coming Up Next

The team is planning several public relations events for the near future. We are looking forward to attending the **Canadian International Autoshow** in Toronto from February 17th to the 26th. Our brand new interactive display will help educate the public on solar technology, as well as efficient and light design of mechanical and electrical systems.

For the spring, BlueSky is planning a series of lectures to showcase the wide variety of sustainable technology alternatives in transportation. The focus of the lecture series is to highlight the use of sustainable energy sources for public transit. For the most recent updates, information, and pictures refer to our website: **www.blueskysolar.utoronto.ca.**

Mitren and Chris working on upper aerobody ribbing

Adopt – A – Cell

Blue Sky's Adopt-A-Cell program allows individuals to take part in the world of solar powered racing. By adopting a solar cell, you are showing your support for not only the advancement of future renewable power sources, but also the development of the great minds that will lead the way. Donors' names will appear on the back of the solar cells of our new array. Check out the full donors list below and enclosed flyer for details. Donations forms are also available on our website.

New Supporters

The Blue Sky team would like to expressly thank all of our supporters who have helped us through the very difficult 2005 racing season. It is only with their support and inspiration we are able to continue our pursuit of efficient and sustainable energy technology. To show our gratitude, the Blue Sky team will give all 2005 sponsors recognition through 2007 to allow them to participate in our comeback season.

A long standing supporter of BlueSky Solar Racing, **Bombardier Aerospace** has renewed their support at the Associate level, providing us access to valuable manufacturing facilities for the construction of our aeroshell.

Blehm Plastics Inc and **Cass Polymers Inc** have provided the epoxies required to complete our plugs and moulds. Fibreglass was provided in part by **BGF Industries Inc**. Blehm Plastics, based Hazel Park, Michigan, specializes in the production of epoxies for tooling. Cass Polymers, based in Oklahoma City, provided plastics for finishing the plugs. BGF Industries located at Greensboro, NC, is a supplier to markets that require technically complex application of fibers made of glass, carbon, aramid and other advanced composite reinforcements

A new supporter, **The Toronto Star** has come on board to help us with our public relations initiatives. The Toronto Star is a local Toronto newspaper reporting on news, business, weather, sports, and much more.

Timminco, a world leader in manufacturing and supplying engineered magnesium extrusions, has renewed their sponsorship this season with a supply of magnesium alloy. **Jroberts**, another returning sponsor, has provided machining services to turn the magnesium into the rims for our car.

Materials for the manufacture of our solar car aeroshell were provided in part by **JD Lincoln, Composites Atlantic, Euro-Composites,** and **Airtech**. We are still searching for additional composite materials to complete the car.

Lenovo a new supporter of the team, provided us with two high-end laptops. Lenovo is a worldwide computer manufacturer who recently acquired the computer division at IBM, along with the rights to the Thinkpad line of computers.

PPT optimized for the 2007 car

Photo:Patrick Pritchard

Tom setting up array demo during Sunlight is Life presentation

Honeywell, Canada's controls company, offering a wide spectrum of technology solutions, including energy saving ones, soldered the PPT circuits.

The mechanical systems of the new car are made possible through the support of **Integris Metals**, who have supplied the team with aluminium. Integris Metals is North America's a distributor and processor of metals.

Top aerobody awaiting final touches and painting

2007 Season Sponsors

INSPIRATION

-TBD-

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UNIVERSITY of TORONTO

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ADOPT-A-CELL Donors

Vince Brewerton [x3], J.Chen, Michael DeMonte, Marta Ecsedi [x2], Eric Fleming [x2], Enrico Gentilini [x5], Maryam Latifpoor, Malcolm McGrath [x3], Robert Morrison, Julia Oung, Il-Yong Park, Barry Rawn, Timoteo Soto [x3], Hannah Stein, Jillian Stein, Andy Peredery, John Baby, Sonja Baby, Susan Grant [x4], Robert J. Birgeneau [x3], Kamran Bahrami [x3], Cindy Yelle, k/m/s/b/i

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